

**CLAIMS:**

1. A storage system comprising:
  - means for reading and writing information on a storage disk consisting of a magnetic recording head comprising a magneto-resistance sensor (MR); and
  - means for storing said information in said storage disk, wherein said storage disk comprises a magneto-optical (MO) type media having a diamond like carbon overcoat layer and a lubrication layer formed on at least one surface thereof.
2. The storage system of claim 1 wherein said magneto-optical (MO) type media is comprised of double sided optically assisted Winchester media.
3. The storage system of claim 1 wherein said magneto-optical (MO) type media comprises:
  - a substrate formed of a material selected from the group consisting of polymer, metal, glass, ceramic, and glass-ceramic;
  - a dielectric layer formed atop said substrate;
  - a magnetic layer comprising a soft magnetic material formed atop said dielectric layer;
  - a hard magnetic layer comprising a rare earth transition metal formed atop said magnetic layer;
  - a thin passivation layer formed atop said hard magnetic layer;
  - the diamond like carbon overcoat layer formed atop said thin passivation layer;and
  - the lubrication layer formed atop said diamond like carbon overcoat layer, said lubrication layer including a PFPE lubricant.
4. The storage system of claim 1 wherein the magnetic recording head comprises a reader and a writer, wherein the reader comprises a giant magneto-resistance (GMR) sensor.

5. The storage system of claim 4 wherein the writer comprises a high saturation moment ( $B_{sat}$ ) material, wherein the  $B_{sat}$  is from about 16,000 Gauss to about 21,500 Gauss.
6. The storage system of claim 5 wherein the writer is made of a high saturation moment ( $B_{sat}$ ) material selected from the group consisting of  $NiFeCoX$ ,  $FeAlN$ ,  $FeRhN$ , wherein  $X$  is selected from the group consisting of  $N$  and  $B$ .
7. The storage system of claim 3 wherein said magnetic layer comprises a material selected from the group consisting of  $NiFe$ ,  $AlSiFe$  and  $NiFeCuMo$ .
8. The storage system of claim 3 wherein said hard magnetic layer comprises a material selected from the group consisting of  $TbFe$ ,  $TbFeCo$ ,  $DyFeCo$  and  $(Tb,Dy)FeCoX$ , wherein  $X$  is selected from the group consisting of  $Al$ ,  $Y$  and  $Nd$ .
9. The storage system of claim 3 wherein said lubricant comprises a material selected from the group consisting of Z-DOL, MMW Z-DOL and AM2001.
10. The storage system of claim 1 wherein the magnetic resistance sensor is comprised of a spin valve.
11. The storage system of claim 10 wherein said spin valve is formed of multiple layers, the multiple layers being comprised independently of  $Ta$ ,  $NiFe$ ,  $Co$ ,  $Cu$ ,  $CoNiFe$  and an exchange bias layer, and wherein said exchange bias layer is selected from the group consisting of  $FeMn$ ,  $IrMn$ ,  $NiCoMn$ ,  $NiCoO$ ,  $ThCo$  and  $NiO$ .
12. The storage system of claim 1 wherein said storage disk is comprised of superlattice multilayer media.
13. The storage system of claim 3 further comprising a readout layer formed in between said thin passivation layer and said overcoat layer.

14. The storage system of claim 12 wherein said superlattice multilayer media is comprised of:

- a substrate formed of polymer, metal, glass, ceramic or glass-ceramic material;
- a first layer made of a precious metal formed atop said substrate;
- a series of superlattice multilayers formed atop said first layer, said series being comprised of alternating layers of Co and either Pt or Pd;
- an overcoat layer formed atop said superlattice multilayer; and
- a lubrication layer formed atop said overcoat layer, said lubrication layer including a PFPE lubricant.

15. The storage system of claim 14 further comprising a soft magnetic layer formed in between said substrate and said series of superlattice multilayers.

16. The disk of claim 13 wherein said readout layer is selected from the group consisting of GdFeCo, GdFeCoX, GdFeCoXY where X is Al, Nd or Y and Y is, Cr, Ta or Nb and CoCrGdX, where X is Al.